

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

OYSTEIN GOMO

Serial No.: 10/595,306

Filed: November 17, 2006

For: MEDICAL PATIENT SIMULATOR

Attorney Docket No.: PROT 0103 PUSA

Group Art Unit: 3715

Examiner: Jerry D. Fletcher

**APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
U.S. Patent & Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief from the final rejection of claims 1, 3, 4, 7, 11 to 13, and 18 in the final Office Action dated February 18, 2010, and maintained in the Advisory Action dated May 21, 2010, for the above-identified patent application.

**I. REAL PARTY IN INTEREST**

The real party in interest is Laerdal Medical AS, a corporation organized and existing under the laws of the country of Norway, and having a place of business in Stavanger, Norway N-4002, as set forth in the assignment recorded in the U.S. Patent and Trademark Office on April 7, 2006 at Reel 018520 / Frame 0597.

## **II. RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences known to the Appellant, the Appellant's legal representative, or the Assignee which may be directly affected or be directly affected by or have a bearing on the Board's decision in the pending appeal.

## **III. STATUS OF CLAIMS**

Claims 1, 3, 4, 7, 11 to 13, 15, and 18 are pending in this application. Claims 1, 3, 4, 7, 11 to 13, and 18 been rejected and are the subject of this appeal. Claims 2, 5 to 6, 8 to 9, 10, 14, and 16 to 17 have been cancelled. Claim 15 has been allowed according to the Advisory Action dated May 21, 2010.

## **IV. STATUS OF AMENDMENTS**

A response with amendments to the application directed to the non-final Office Action dated August 18, 2009, was filed on November 18, 2009 and has been accepted. An after-final response was timely filed on May 14, 2010 and accepted, wherein claims 10 and 16 to 17 are cancelled and claim 15 is rewritten in independent form as suggested by the Examiner. According to the Advisory Action dated May 21, 2010, claim 15 has been allowed.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

The application has three (3) independent claims: claims 1, 4, and 7.

Independent claim 1 is directed to a medical patient simulator for simulation of subcostal retractions of an infant (*see* for instance Title and lines 3 to 4 on page 1 of the original specification), comprising: a torso containing at least one artificial lung adapted for inflation by external air supply and a sternum (*see* for instance Abstract, lines 28 to 30 on page 7 of the original specification, and Figures 1 and 2); a chest skin placed at least partially on the outside of the torso (*see* for instance Abstract, lines 28 to 30 on page 7 of the original specification, and

Figure 1 and 2); a means for pulling down the chest skin providing an external visible depression of the skin below the sternum of the torso (*see* for instance Abstract and Figures 1 and 2); where the means includes a mechanism adapted to pull the chest skin in a synchronous fashion with the at least one lung raising and lowering the chest (*see* for instance lines 30 to 33 on page 1 and lines 16 to 17 on page 13 of the original specification and Figures 1 and 2), said means further including an elastic pulling strap attached to the inside of the skin approximately in the middle of the area where subcostal retractions occur (*see* for instance lines 17 to 25 on page 1 and lines 11 to 13 on page 13 of the original specification); said means and said artificial lung being coupled so that when said means are actuated to pull in the chest skin, said means and said artificial lung are adapted to move synchronously (*see* for instance lines 14 to 18 on page 8 of the original specification).

Independent claim 4 is directed to a medical patient simulator (*see* for instance Title and lines 3 to 4 on page 1 of the original specification), in particular a simulator for simulation of an infant (*see* for instance line 31 on page 11 to line 4 on page 12 of the original specification and Figure 5), comprising; a torso containing at least one lung, with the option of altering the compliance of the at least one lung (*see* for instance Abstract, lines 28 to 30 on page 7 of the original specification, and Figures 1 and 2), where the at least one lung is disposed between a first and second plate in the torso, the spacing of the plates being adjustable, the second plate being fixed relative to the torso (*see* for instance lines 8 to 14 on page 3 of the original specification), and the first plate being movable relative to the torso (*see* for instance lines 15 to 23 on page 3 of the original specification); a pneumatically driven mechanism being adapted to force the first plate towards the second plate, the pneumatically driven mechanism including a bellows (*see* for instance line 9 on page 2 of the original specification; and a flexible means connecting the pneumatically driven mechanism to the second plate to provide the force between the first and second plate, said flexible means having an initial slack so that the first plate is free to move relative to the second plate when the pneumatically driven mechanism is inactive (*see* for instance lines 1 to 5 on page 9 of the original specification).

Independent claim 7 is directed to a medical patient simulator (*see* for instance Title and lines 3 to 4 on page 1 of the original specification), in particular a simulator for simulation of an infant (*see* for instance line 31 on page 11 to line 4 on page 12 of the original specification and Figure 5), comprising: a torso, for simulation of muscle activity in a patient; the torso having at least two actuators, the first and second actuator being arranged on the right and left sides, respectively, of the backside of the torso (*see* for instance lines 7 to 17 on page 14 and lines 29 to 31 on page 4 of the original specification, and Figure 3); wherein the at least two actuators are being designed to be operated in at least the following modes: a mode for simulation of normal muscle movement, alternate and regular activation of the at least two actuators on the left and right sides; a mode for simulation of muscle spasms, rapid and irregular activation of the at least two actuators on the left and right sides; and a mode for simulation of defibrillation, rapid activation of the at least two actuators simultaneously, once for each defibrillation, wherein the at least two actuators are air cushions situated near the outer surface of the simulator to act between a rigid part of the simulator and a surface upon which the simulator is placed (*see* for instance lines 1 to 9 on page 5 of the original specification) .

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1 and 3 stand rejected under 35 U.S.C. 103(a) over Lampotang (U.S. Patent No: 5,779,484, hereinafter "*Lampotang*"), in view of Gordon et al. (U.S. Patent No: 3662,076, hereinafter "*Gordon*") and Pollock (U.S. Patent No: 1,974,366, hereinafter "*Pollock*"). See pages 2 to 4 of the Office Action.

Claims 4, 9 and 11 to 13 stand rejected under 35 U.S.C. 103(a) over *Lampotang* in view of Ingenito et al. (U.S. Patent No: 4,932,879, hereinafter "*Ingenito*") and Kahle et al. (U.S. Patent No: 5,153,635, hereinafter "*Kahle*"). See pages 4 to 6 of the Office Action.

Claim 7 stands rejected under 35 U.S.C. 103(a) over *Lampotang* in view of Johnson et al. (U.S. Patent No: 5,394,766, hereinafter "*Johnson*") and Thu et al. (U.S. Patent No: 6,336,047, hereinafter "*Thu*"). See pages 6 to 8 of the Office Action.

Claim 18 stands rejected under 35 U.S.C. 103(a) over *Lampotang*, *Ingenito*, *Kahle* and further in view of *Gordon* and *Pollock*. See pages 10 to 11 of the Office Action.

## **VII. ARGUMENT**

The Applicant's invention relates to a simulator that mimics certain particular breath patterns, for instance, breath patterns associated with the subcostal retractions. See for instance lines 12 to 15 on page 1 of the original specification. Subcostal retractions occur when a patient has difficulties breathing due to an obstruction of the respiratory passage. See for instance lines 19 to 21 on page 1 of the original specification.

In one or more embodiments, the simulation of the subcostal retractions may be achieved by using means that pull down the chest skin of the simulator in an area that corresponds to an area where such retractions would occur on a human being. See for instance lines 23 to 25 on page 1 of the original specification. In certain instances, this can be done by attaching or integrating an elastic strap to the inside of the chest skin in the middle of the area where the retractions occur. See for instance lines 27 to 28 on page 1 of the original specification.

In one or more embodiments, the simulator can be configured to allow for a change in the compliance of the lungs, for instance, the resistance offered by the lungs during artificial respiration, which again provides a solution, previously not known in the art, for a simulator which offers different degrees of lung compliance. See for instance lines 1 to 6 on page 3 of the original specification. In certain instances, different compliance of the lungs can be simulated by placing the lung or lungs between two plates in the chest, wherein the spacing between the plates or their resistance against moving apart can be altered and resistance to inflate the lungs can be altered. See for instance lines 11 to 14 on page 3 of the original specification.

In one or more embodiments, the simulator can be configured, for instance with the employment of air cushions on certain parts of the simulator, to simulate spasm or other signs of life. See lines 24 to 27 on page 4 of the original specification. In certain instances, initiating rapid and irregular actuation of actuation of the air cushions creates random spasmodic reactions; more regular and more complete filling and emptying the air cushions, alternating between the right and left sides, simulates normal body movements in a patient regaining consciousness. See for instance lines 12 to 17 on page 5 of the original specification.

*Lampotang* relates to apparatus and method of simulating breathing sounds. See Title and Abstract. As shown in Figure 1, a patient simulator consists of a manikin 4 placed on atop of a table 2. Area 52 of the manikin 4 indicates the general area for placement of heart and

lung sound devices subcutaneous to the manikin 4. *See* for instance lines 42 to 62 of column 13. Computer 16 controls the single board computers 508 which manage the various subsystems of the patient simulator 1. *See* for instance lines 19 to 22 of column 15. To simulate sounds for heart, lung, esophageal, or bowel in the correct locations, any array of small speakers is distributed below the skin of the manikin 4 at locations near 52. *See* for instance lines 41 to 45 of column 26.

*Johnson* relates to a robotic human torso. *See* for instance Title and Abstract. *Johnson* aims to duplicate the movement of a human torso in a robotic torso having the same shape and size of a human torso. *See* for instances lines 20 to 28 in column 4. In particular, the robotic torso includes a pair of brackets 42, 42' which are hinged together along one end with a hinge pin 44 can be mounted to the top of A-frame 26, by mounting the end of hinge pin 44 in bore 46, in order to provide a mounting surface for the pivotal movement of the shoulders up and down. *See* lines 60 to 64 of column 9 and Figures 1, 2, and 5. More particularly, a bore can be provided in the end of left bracket 42, for pivotally attaching a left shoulder rotac 50 for movement forward and back, and a bore can be provided in the end of right bracket 42' for pivotally attaching a right shoulder rotac 50' for movement forward and back. *See* for instance lines 4 to 9 of column 10.

*Gordon* relates to a cardiac training mannikin. *See* for instance Title and Abstract. *Gordon* aims to provide a training mannikin to simulate heart beat, pulse, and breathing action for a variety of cardiac conditions. *See* for instance lines 47 to 51 of column 1. In particular, the mannikin is configured to simulate pulse action at a plurality of pulse locations, through the use of vertical push rods 28. *See* for instance lines 57 to 60 of column 2 and Figure 2. The push rods 28 are for limited vertical reciprocation. *See* for instance lines 54 to 55 of column 6.

*Thu* relates to communications system between training sensor and electrodes of a defibrillator. *See* for instance Title and Abstract. *Thu* discloses that for patient treatment, the

electrodes should be placed in the correct position on the patient, so as to deliver sufficient energy to the heart muscle. *See* for instance lines 22 to 26 of column 2. In particular, simulated physiological parameters and actions on the training equipment are communicated to the AED/AED-T (defibrillator/defibrillator-trainer). *See* for instance lines 17 to 23 of column 3.

**A. *Claims 1 and 3 Are Patentable Under  
35 U.S.C. § 102(a) Over Lampotang, Gordon, and Pollock***

Claims 1 and 3 stand rejected under 35 U.S.C. 103(a) over *Lampotang* in view of *Gordon* and *Pollock*. *See* pages 2 to 4 of the Office Action. For at least the reasons set forth below, Applicants respectfully traverse. Reversal of the rejection of claims 1 and 3 under 35 U.S.C. 103(a) over *Lampotang, Gordon, and Pollock* is respectfully solicited.

Independent claim 1 recites a simulator for simulation of subcostal retraction comprising, among other things, a means for pulling down the chest skin providing an external visible depression of the skin below the sternum of the torso, in a synchronous fashion with the at least one lung raising and lowering the chest, the means further including an elastic pulling strap attached to the inside of the skin approximately in the middle of the area where subcostal retractions occur.

*Re: the claimed limitation in relation to  
an elastic pulling strap*

The Examiner admits that *Lampotang* fails to teach a means for pulling down the chest skin providing an external visible depression of the skin below the sternum of the torso or an elastic pulling strap attached to the inside of the skin approximately in the middle of the area where contractions occur. *See* page 3 of the instant Office Action.

*Gordon* fails to cure *Lampotang*'s above-mentioned deficiency. *Gordon* uses rigid vertical push rods 28 at variable pulse locations to simulate pulse action. *See* col. 2, lines 57-60 and Figure 2. Each of the rigid vertical push rods 28 is mounted for limited vertical reciprocation in a particular sequence. *See* col. 3, line 1-4 and Figure 3. The rigid vertical push rods 28 are selectively forced to move in an upward direction against the skin of the manikin to effect a pulse-like movement. *See* col. 3, lines 34-39. *Gordon* does not teach a means for pulling down the chest skin. Contrary to a flexible strap in claim 1 for pulling down the chest skin such that the chest skin moves from forming a visible depression to returning to a resting level, the rigid push rods 28 in *Gordon* are to push up the chest skin such that the chest skin changes from forming a visible raising and to returning to its resting level.

Moreover, it would not be a simple design option, and contrary to what the Examiner has suggested, to replace the rigid push rod 28 with an elastic pulling strap, as it would not be practical, if not all impossible, to use an elastic pulling strap, for instance a rubber band, for pushing up against the pressure exerted by the chest skin. There is no need to attach, push rod 28 to the skin, while it is necessary to affix Applicant's pull strap to the skin to draw the skin inward to form a visible depression. *Lampotang* and *Gordon* do not fairly suggest this feature nor this function.

*Pollock* fails to cure the above-mentioned deficiency of *Lampotang* and *Gordon*, alone or in combination. The Examiner asserts that *Pollock* teaches the use of an elastic strap on the inside of a dummy to pull the area where it is located to simulate skin movement, citing lines 66 to 80 on page 1. *See* page 3 of the instant Office Action. To the contrary, *Pollock* does not describe the use of an elastic strap. In fact, it is clearly stated in *Pollock* that the cords or bands are inextensible. *See* lines 66 to 70 on page 1.

*Re: the claimed limitation in relation to  
subcostal contractions*

The term "retractions" is generally explained as visible sinking in of the chest wall with inspiration in a patient with respiratory difficulty; and the term "subcostal retractions" refers to retractions observed below the rib cage or the sternum, which is a very specific area of the body. *See* for instance lines 11-21 on page 1 of the original specification. Subcostal retractions is a very rare but serious condition that is caused by severely restricted airways in patients, particularly child and infant patients. The area below the sternum is a very soft area. A simulator designed to simulate subcostal retractions must be able to represent the soft area. The simulator according to claim 1 uses an elastic strap, which well accommodates the need for representing the soft subcostal area.

The Examiner admits that Lampotang fails to specifically teach a simulator having means attached for simulating subcostal contractions. *See* page 3 of the final Office Action. However, the Examiner asserts that *Gordon* teaches a patient simulator for simulating subcostal retractions wherein the skin on the torso is moved in order to simulate breathing, citing lines 49 to 60 in column 4. *See* page 3 of the instant Office Action.

It is noted that *Gordon*, in its entire content, makes no mention of "subcostal" or "subcostal contractions."

Moreover, and contrary to the Examiner's assertion, the mere fact that *Gordon's* simulator is able to simulate breathing does not by itself evidence the simulation of subcostal contractions. As mentioned above, *Gordon* does not teach or suggest that the push rods are attached to the skin, or are functional to pull down the skin to form a visible depression. Even if *Gordon's* push rods could be modified to be attached to the skin or to be able to pull down the skin, the testing skin area with resultant depression would be formed against the rigid push rods

and therefore not soft. Notably *Gordon*'s lowering of its chest skin is merely a returning from its preceding raised position to its steady resting position. Again, as stated herein above, *Gordon* does not teach the chest skin is visibly depressed, nor does *Gordon* teach or suggest a mechanism to pull down the chest skin to cause it visibly depressed.

**B. Claims 4, 9, and 11 to 13 Are Patentable Under 35 U.S.C. § 103(a) Over Lampotang In View of Ingenito, and Kahle**

Claims 4, 9 and 11 to 13 stand rejected under 35 U.S.C. 103(a) over *Lampotang* in view of *Ingenito* and *Kahle*. See pages 4 to 6 of the Office Action. For at least the reasons set forth below, Applicants respectfully traverse. Reconsideration and reversal of the rejection of claims 4, 9, and 11 to 13 under 35 U.S.C. 103(a) over *Lampotang* in view of *Ingenito* and *Kahle* is solicited.

Independent claim 4 recites a simulator comprising: a torso containing at least one lung disposed between a first and second plate, the second plate being fixed relative to the torso, and the first plate being movable relative to the torso; a pneumatically driven mechanism to force the first plate towards the second plate, the pneumatically driven mechanism including a bellows; and a flexible means connecting the pneumatically driven mechanism to the second plate to provide the force between the first and second plate, said flexible means having an initial slack so that the first plate is free to move relative to the second plate when the pneumatically driven mechanism is inactive.

In rejecting claim 4, and as stated on pages 4-5 of the final Office Action, the Examiner essentially asserts that *Lampotang* does not teach a torso having a lung arranged between a first and second plate, the spacing therebetween being adjustable, nor does *Lampotang* teach a flexible means connecting a pneumatically driven mechanism and the second plate. However, the Examiner asserts *Ingenito* and *Kahle* cure *Lampotang*'s deficiencies because *Ingenito* teaches a plate structure wherein a lung is disposed between a

first and second plate, and because *Kahle* discloses an elastic straps having slack. Further, the Examiner argues that it would have been obvious to supplement *Lampotang*'s simulator with *Ingenito*'s plate structure and to replace *Lampotang*'s rigid piston construction with a flexible means "as claimed by the applicant".

As a threshold matter, an obviousness rejection cannot be based on the Applicant's own teaching. Therefore, to say it is obvious to replace the rigid piston structure of *Lampotang* with Applicant's flexible means as suggested by the Examiner is impermissible hindsight construction.

Moreover, *Lampotang*'s simulator does not accommodate a plate structure of *Ingenito* wherein two plates are movable relative to each other, contrary to the Examiner's assertions cited above. It is noted, and as shown in Figure 2, *Lampotang* teaches that a lung bellows 100 is disposed away from either top plate 120, or a bottom plate 112. Moreover, plates 120 and 112 are movable together as they are both connected to a rigid piston rod 114. Therefore, plates 120 and 112 are not positioned such that one plate is movable while the other is not movable but rather fixed as required in claim 4. In *Lampotang*, the rod and piston 114, 112 have to be moved along the plate 120. The plate 120 is, therefore, not free to move unrestricted, as being confined by the rod and piston 114, 112.

Additionally, the cited combination, alone or in combination, fails to teach a flexible means connecting the second plate and a pneumatically driven mechanism, wherein the flexible means has an initial slack. Note that the Examiner has characterized *Lampotang*'s bellows 100 disposed in between the plates 120 and 112 as equivalent to the at least one lung disposed between a first and second plate as recited in claim 4. In this characterization, *Lampotang* does not disclose, and the Examiner has in fact failed to identify, a pneumatically driven mechanism as recited in claim 4. In essence, *Lampotang*'s bellows 100 cannot be characterized as both the lung and the pneumatically driven mechanism specified in claim 4. Neither *Ingenito* nor *Kahle* disclose the claimed feature in relation to the

pneumatically driven mechanism as specified in claim 4, and therefore fails to cure *Lampotang*'s above-mentioned deficiency.

**C. *Claim 7 is Patentable Under  
35 U.S.C. § 103(a) Over Lampotang In View of Johnson and Thu***

Claim 7 stands rejected under 35 U.S.C. 103(a) over *Lampotang* in view of *Johnson* and *Thu*. See pages 6 to 8 of the Office Action. For at least the reasons set forth below, Applicants respectfully traverse. Reconsideration and reversal of the rejection of claim 7 under 35 U.S.C. 103(a) over *Lampotang* in view of *Johnson* and *Thu* is solicited.

Independent claim 7 recites a medical patient simulator comprising, among other things, a torso having at least two actuators being arranged on the right and left sides of the backside of the torso, wherein the at least two actuators are air cushions situated near the outer surface of the simulator to act between a rigid part of the simulator and a surface upon which the simulator is placed.

On page 6 of the Office Action, the Examiner admits *Lampotang* does not teach the claimed feature of a torso having two actuators arranged on the backside of the torso for simulation of muscle movement. Neither does *Lampotang* teach or suggest the claimed limitation that the two air cushion actuators are situated near the outer surface of the simulator to act between a rigid part of the simulator and a surface upon which the simulator is placed.

*Johnson* fails to cure *Lampotang*'s above-mentioned deficiency. *Johnson* is directed to robotic human torso and elements 50 and 50' are left and right shoulder rotacs for movement forward and back to pivot about the clevis pins 54, 54'. See col. 10, lines 4-9 and

24-29. *Johnson* makes no mention of employing the rotacs 50, 51' for simulating muscle movements; nor does *Johnson* teach that the rotacs 50, 51' are arranged on the backside of the torso as required in claim 7. As depicted in Figures 1-6, the rotacs 50, 51' are substantially centrally position along a cross-section of the manikin for providing forward and back shoulder movements. As stated on page 9 of Applicants' Amendment dated July 6, 2009, *Johnson* teaches that elements 50 and 50' of robotic human torso are left and right shoulder rotacs for movement forward and back to pivot about the clevis pins 54, 54'. Contrary to *Johnson* wherein the rotacs 50, 50' are disposed within the torso body for providing forward and back shoulder movements, the simulator of claim 7 recites that the air cushion actuators are situated outside of the torso, and more particularly on the backside of the torso, for simulation of muscle movement wherein inflation and deflation on the air cushion actuators result in shaking or spasm of at least a portion of the body.

*Thu* fails to cure the above-mentioned deficiencies of *Lampotang* and/or *Johnson*. Contrary to the Examiner's assertions stated on page 7 of the Office Action, it would not have been obvious to one of ordinary skill in the art to have used *Johnson's* actuators 50, 50' to simulate a patient's movements taught by *Thu*. *Thu* is directed to a communication system between training sensors and electrodes of a difibrillator (Title), and in particular to a system having a plurality of sensors attached to a manikin to effect a wireless and bi-directional communication. See claim 1 of *Thu*. Moreover, *Thu* does mention spasms but provides no explanation as to how these spasms can be simulated. The Examiner has not set forth how the rigid shoulder rotacs 50, 50' would simulate muscle movement, nor has the Examiner set forth any articulated reasoning that the sensor-mediated communication system of *Thu* would cure deficiencies of *Lampotang* and *Johnson* in failing to teach two or more actuators located on the backside of a torso for simulating muscle movement.

**D. Claim 18 Is Patentable Under 35 U.S.C. § 103(a)**

**Over Lampotang In View of Ingenito, Kahle, Gordon, and Pollock**

Claim 18 stands rejected under 35 U.S.C. 103(a) over *Lampotang*, *Ingenito*, *Kahle* and further in view of *Gordon* and *Pollock*. See pages 10 to 11 of the Office Action. For at least the reasons set forth below, Applicants respectfully traverse. Reconsideration and reversal of the rejection of claim 18 under 35 U.S.C. 103(a) over *Lampotang* in view of *Ingenito*, *Kahle*, *Gordon*, and *Pollock* is solicited.

Claim 18 recites a medical patient simulator of claim 4 further comprising a strap for pulling down the chest skin providing an external visible depression of the chest skin below the sternum of the torso, wherein the strap is attached to the chest skin from inside the torso, and wherein the strap and the lung are coupled to move synchronously.

The Examiner admits that *Lampotang*, *Ingenito*, and *Kahle* together fail to teach this feature of claim 18. See page 10 of the Office Action.

As stated in subsection "A" of this paper, and contrary to the assertions stated on page 10 of the Office Action, *Gordon* and *Pollock* do not teach the above-cited feature of claim 18, and therefore fail to cure the deficiency of *Lampotang*, *Ingenito*, *Kahle*.

The Appeal Brief fee of \$540.00 is being charged to Deposit Account No. 02-3978 via electronic authorization submitted concurrently herewith. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments as a result of the filing of this paper to Deposit Account No. 02-3978.

Respectfully submitted,

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Enclosure - Appendices

## **VIII. CLAIMS APPENDIX**

1. A medical patient simulator for simulation of subcostal retractions of an infant, comprising:

a torso containing at least one artificial lung adapted for inflation by external air supply and a sternum;

a chest skin placed at least partially on the outside of the torso;

a means for pulling down the chest skin providing an external visible depression of the skin below the sternum of the torso;

where the means includes a mechanism adapted to pull the chest skin in a synchronous fashion with the at least one lung raising and lowering the chest, said means further including an elastic pulling strap attached to the inside of the skin approximately in the middle of the area where subcostal retractions occur;

said means and said artificial lung being coupled so that when said means are actuated to pull in the chest skin, said means and said artificial lung are adapted to move synchronously.

3. A medical patient simulator according to Claim 1, wherein the mechanism is a pneumatic mechanism including a bellows.

4. A medical patient simulator, in particular a simulator for simulation of an infant, comprising;

a torso containing at least one lung, with the option of altering the compliance of the at least one lung, where the at least one lung is disposed between a first and second plate in the torso, the spacing of the plates being adjustable, the second plate being fixed relative to the torso, and the first plate being movable relative to the torso;

a pneumatically driven mechanism being adapted to force the first plate towards the second plate, the pneumatically driven mechanism including a bellows;

and a flexible means connecting the pneumatically driven mechanism to the second plate to provide the force between the first and second plate, said flexible means having an initial slack so that the first plate is free to move relative to the second plate when the pneumatically driven mechanism is inactive.

7. A medical patient simulator, in particular a simulator for simulation of an infant, comprising:

a torso, for simulation of muscle activity in a patient;

the torso having at least two actuators, the first and second actuator being arranged on the right and left sides, respectively, of the backside of the torso;

wherein the at least two actuators are being designed to be operated in at least the following modes:

a mode for simulation of normal muscle movement, alternate and regular activation of the at least two actuators on the left and right sides;

a mode for simulation of muscle spasms, rapid and irregular activation of the at least two actuators on the left and right sides; and

a mode for simulation of defibrillation, rapid activation of the at least two actuators simultaneously, once for each defibrillation, wherein the at least two actuators are air cushions situated near the outer surface of the simulator to act between a rigid part of the simulator and a surface upon which the simulator is placed.

11. The medical patient simulator of claim 4 further comprising a third and fourth plate in the torso, and the bellows arranged between the third and fourth plate.

12. The medical patient simulator of claim 4, wherein the flexible means is an elastic strap.

13. The medical patient simulator of claim 11, wherein one of the third and

fourth plates is the first plate and is arranged over the lung.

15. A medical patient simulator for simulation of subcostal retractions of an infant, comprising:

a torso containing at least one artificial lung adapted for inflation by external air supply and a sternum;

a chest skin placed at least partially on the outside of the torso;

a means for pulling down the chest skin providing an external visible depression of the skin below the sternum of the torso;

where the means includes a mechanism adapted to pull the chest skin in a synchronous fashion with the at least one lung raising and lowering the chest, said means further including an elastic pulling strap attached to the inside of the skin approximately in the middle of the area where subcostal retractions occur, the mechanism being a pneumatic mechanism including a bellows;

said means and said artificial lung being coupled so that when said means are actuated to pull in the chest skin, said means and said artificial lung are adapted to move synchronously;

the medical patient simulator further comprising a chest plate disposed against said bellows of said pneumatic mechanism and said artificial lung, a lever being hinged to said chest plate and being coupled to said elastic strap, said bellows being situated between said lever and said chest plate, and said chest plate, said bellows and said lever being adapted to move with inflation and deflation of said artificial lung.

18. A medical patient simulator of claim 4 further comprising a strap for pulling down the chest skin providing an external visible depression of the chest skin below the sternum of the torso, wherein the strap is attached to the chest skin from inside the torso, and wherein the strap and the lung are coupled to move synchronously.

**IX. EVIDENCE APPENDIX**

None.

**X. RELATED PROCEEDINGS APPENDIX**

None.